1. No.
   2021G029

2. Title
   Influence of exposure to cigarette smoke on fetal liver development

3. Period
   2021-2023

4. Summary
   It is widely known that cigarette smoking during pregnancy not only affects the maternal health condition but also causes serious problems in the babies. In contrast, its influences on the development of specific organs, especially the liver, have not been fully understood. This study was designed to clarify the influences of cigarette smoking on the fetal liver development from the viewpoints of proliferation and maturation of fetal hepatic progenitor cells (HPCs). HPCs were isolated from E13.5 murine fetal liver and incubated for 7 days with HGF and EGF for a colony forming assay, or cultured in the presence of oncostatin M that induces their functional maturation to hepatocytes. Tabaco extracts as well as the representative components were tested for their effects on HPC proliferation and maturation. Administration of tobacco extracts into the culture medium of HPCs at the concentrations that exhibited no cytotoxicity suppressed both proliferation and maturation of HPCs. Among the representative tobacco components, nicotine decreased the gene expression levels of albumin, Hnf4a, and glutamine synthetase induced by oncostatin M, whereas acetaldehyde suppressed gene expression of cytochrome P450 drug-metabolizing enzymes. Taken together, these results indicate that the harmful effects of cigarette smoking during pregnancy on the development of fetal liver are attributable, at least in part, to the suppressive effects of tobacco components on both proliferation and maturation of fetal HPCs.